UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/620,060	07/15/2003	Robert M. Guidash	85354PCW	7686

7590 05/14/2009

Thomas H. Close
Patent Legal Staff
Eastman Kodak Company
343 State Street
Rochester, NY 14650-2201

EXAMINER	
YODER III, CHRISS S	

ART UNIT	PAPER NUMBER
2622	

MAIL DATE	DELIVERY MODE
05/14/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/620,060	GUIDASH, ROBERT M.	
	Examiner	Art Unit	
	CHRISS S. YODER III	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 9, 2009 has been entered.

Response to Arguments

Applicant's arguments with respect to claims 5, 8, 11, 22, 26, and 37 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 22, 24, 25, 37, 39 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Kochi (US Pub. 2002/0018131).**

2. In regard to **claim 22**, note Kochi discloses the use of an image sensor comprising a plurality of light receiving elements each having a photodetector and a transfer mechanism (paragraphs 0024-0025, and figures 1-2: photodiodes and transfer gates), a plurality of charge to voltage conversion regions (paragraph 0025, and figures 1-2: the floating diffusion nodes), wherein the plurality of light receiving elements are arranged into groups with each group including two or more light receiving elements that share and are connected to a respective common charge to voltage conversion region (paragraphs 0024-0025, and figure 1; the set of pixels connected to an individual floating diffusion node is considered to form a group), and one or more transfer gate signal lines connected to the transfer mechanisms in each group to permit photo-generated charge of two or more light receiving elements in each group to be combined in the shared charge to voltage conversion region (paragraphs 0024-0029, and figures 1-2: each transfer gate has a corresponding signal line).

3. In regard to **claim 24**, note Kochi discloses that the charge of the two or more light receiving elements is substantially simultaneously transferred to the shared charge to voltage conversion region (paragraph 0032).

4. In regard to **claim 25**, note Kochi discloses that the charge of all light receiving elements associated with a common charge to voltage conversion region is transferred to the shared charge to voltage conversion region to form a single voltage signal associated with all of the light receiving elements (paragraph 0032).

5. In regard to **claim 37**, note Kochi discloses the use of a camera comprising an image sensor comprising a plurality of light receiving elements each having a photodetector and a transfer mechanism (paragraphs 0024-0025, and figures 1-2: photodiodes and transfer gates), a plurality of charge to voltage conversion regions (paragraph 0025, and figures 1-2: the floating diffusion nodes), wherein the plurality of light receiving elements are arranged into groups with each group including two or more light receiving elements that share and are connected to a respective common charge to voltage conversion region (paragraphs 0024-0025, and figure 1; the set of pixels connected to an individual floating diffusion node is considered to form a group), and one or more transfer gate signal lines connected to the transfer mechanisms in each group to permit photo-generated charge of two or more light receiving elements in each group to be combined in the shared charge to voltage conversion region (paragraphs 0024-0029, and figures 1-2: each transfer gate has a corresponding signal line).

6. In regard to **claim 39**, note Kochi discloses that the charge of the two or more light receiving elements is substantially simultaneously transferred to the shared charge to voltage conversion region (paragraph 0032).

7. In regard to **claim 40**, note Kochi discloses that the charge of all light receiving elements associated with a common charge to voltage conversion region is transferred to the shared charge to voltage conversion region to form a single voltage signal associated with all of the light receiving elements (paragraph 0032).

8. **Claims 5 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakurai (US Patent 6,784,928).**

9. In regard to **claim 5**, note Sakurai discloses an image sensor comprising a plurality of light receiving elements a portion of which have a color filter mated with the light receiving elements, and the light receiving elements are arranged in an array (column 5, lines 9-17, and figure 6A), a plurality of floating diffusions respectively mated with the plurality of light receiving elements (figure 8; each pixel has a floating diffusion node), two column circuits connected to each column of light receiving elements and used to store the signal from the light receiving elements one row at a time (column 5, line 66 – column 6, line 17, and figure 7; the read out regions above and below the imaging array), and a select switch used to control which column circuit a particular signal from a light receiving element is stored (column 5, line 66 – column 8, line 9) , wherein a color difference readout signal is output when a reset signal for at least one column circuit is obtained by sampling the signal of one color and the light signal level for that column circuit is obtained by sampling the signal of a different color (column 9, line 46 – column 10, line 19; two color signals are sampled and subtracted to output a color difference signal).

10. In regard to **claim 8**, note Sakurai discloses a camera comprising an image sensor comprising a plurality of light receiving elements a portion of which have a color filter mated with the light receiving elements, and the light receiving elements are arranged in an array (column 5, lines 9-17, and figure 6A), a plurality of floating diffusions respectively mated with the plurality of light receiving elements (figure 8; each

pixel has a floating diffusion node), two column circuits connected to each column of light receiving elements and used to store the signal from the light receiving elements one row at a time (column 5, line 66 – column 6, line 17, and figure 7; the read out regions above and below the imaging array), and a select switch used to control which column circuit a particular signal from a light receiving element is stored (column 5, line 66 – column 8, line 9) , wherein a color difference readout signal is output when a reset signal for at least one column circuit is obtained by sampling the signal of one color and the light signal level for that column circuit is obtained by sampling the signal of a different color (column 9, line 46 – column 10, line 19; two color signals are sampled and subtracted to output a color difference signal).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. **Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai (US Patent 6,784,928) in view of Nam (US Patent 7,408,443).**

12. In regard to **claim 6**, note the primary reference of Sakurai discloses the use of an image sensor comprising a plurality of light measuring elements outputting image signals that are selectively stored in one of two column circuits, as claimed in claim 5 above. Therefore, it can be seen that the primary reference fails to explicitly disclose

that all of the signals from the light receiving elements that are in the same column with the same colors are transferred to the same column circuit.

In analogous art, Nam discloses that all of the signals from the light receiving elements that are in the same column with the same colors are transferred to the same column circuit (column 5, lines 14-58 and figure 6; all of the green pixels are transferred to upper ADC 611, and all of the red and blue pixels are transferred to lower ADC 612). Nam teaches that the transfer of all of the signals from the light receiving elements that are in the same column with the same colors to the same column circuit is preferred in order to reduce the fixed pattern noise caused by the spatial difference between the upper and lower column circuits (column 1, lines 60-64, and column 5, lines 54-58). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the transfer of all of the signals from the light receiving elements that are in the same column with the same colors to the same column circuit in order to reduce the fixed pattern noise caused by the spatial difference between the upper and lower column circuits, as suggested by Nam.

13. In regard to **claim 9**, note the primary reference of Sakurai discloses the use of an image sensor comprising a plurality of light measuring elements outputting image signals that are selectively stored in one of two column circuits, as claimed in claim 8 above. Therefore, it can be seen that the primary reference fails to explicitly disclose that all of the signals from the light receiving elements that are in the same column with the same colors are transferred to the same column circuit.

In analogous art, Nam discloses that all of the signals from the light receiving elements that are in the same column with the same colors are transferred to the same column circuit (column 5, lines 14-58 and figure 6; all of the green pixels are transferred to upper ADC 611, and all of the red and blue pixels are transferred to lower ADC 612). Nam teaches that the transfer of all of the signals from the light receiving elements that are in the same column with the same colors to the same column circuit is preferred in order to reduce the fixed pattern noise caused by the spatial difference between the upper and lower column circuits (column 1, lines 60-64, and column 5, lines 54-58). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the transfer of all of the signals from the light receiving elements that are in the same column with the same colors to the same column circuit in order to reduce the fixed pattern noise caused by the spatial difference between the upper and lower column circuits, as suggested by Nam.

14. **Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai (US Patent 6,784,928) in view of Fossum et al. (US Patent 5,949,483).**

15. In regard to **claim 7**, note the primary reference of Sakurai in view of Nam discloses the use of an image sensor comprising a plurality of light measuring elements outputting image signals that are selectively stored in one of two column circuits, as claimed in claim 6 above. Therefore, it can be seen that the primary reference fails to disclose that adjacent samples in each column circuit are averaged. In analogous art, Fossum discloses averaging adjacent samples in each column circuit (column 10, lines

20-53, column 11, lines 23-40, and figure 8). Fossum teaches that the averaging of adjacent samples in each column circuit is preferred in order to improve processing time by reducing the amount of data that is output (column 10, lines 20-53). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the averaging of adjacent samples in each column circuit in order to improve processing time by reducing the amount of data that is output, as suggested by Fossum.

16. In regard to **claim 10**, note primary reference of Sakurai in view of Nam discloses the use of an image sensor comprising a plurality of light measuring elements outputting image signals that are selectively stored in one of two column circuits, as claimed in claim 9 above. Therefore, it can be seen that the primary reference fails to disclose that adjacent samples in each column circuit are averaged. In analogous art, Fossum discloses averaging adjacent samples in each column circuit (column 10, lines 20-53, column 11, lines 23-40, and figure 8). Fossum teaches that the averaging of adjacent samples in each column circuit is preferred in order to improve processing time by reducing the amount of data that is output (column 10, lines 20-53). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the averaging of adjacent samples in each column circuit in order to improve processing time by reducing the amount of data that is output, as suggested by Fossum.

17. **Claims 11-21 and 26-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger et al. (US Patent 4,453,177) in view of Fossum et al. (US Pub. 2003/0117520).**

18. In regard to **claim 11**, note Berger discloses an x-y addressable image sensor comprising a plurality of light receiving elements arranged in an array of rows and columns that convert the light to a signal (column 6, lines 50-67 and figure 4a), at least two signal storage banks comprised of individual signal storage elements (column 7, lines 5-18 and figure 4a: 27,29,37, and 39), the at least two storage banks having enough individual storage elements to store the signals from at least one row of light receiving elements in the array (column 7, lines 5-18 and figure 4a: 27,29,37, and 39), and at least two select mechanisms which can direct signals from the plurality of light measuring elements to any single or combination of the signal storage banks (column 7, lines 5-18 and figure 4a: 41-44, 47 and 49). Therefore, it can be seen that Berger fails to disclose that each of the at least two storage banks has enough individual storage elements to store the signals from at least one row of light receiving elements in the array, and that multiple samples of each signal from at least one row of light receiving elements are concurrently stored in different individual signal storage elements.

In analogous art, Fossum discloses the use of a storage bank that concurrently stores multiple samples of each signal from at least one row of light receiving elements in different individual signal storage elements within a single storage bank (paragraphs 0019-0023, and figure 1a: 102 and 122; the combination of register 120 and 120 is considered to be a single storage bank used to store multiple samples of each pixel).

Fossum teaches that concurrently storing multiple samples of each signal from at least one row of light receiving elements in different individual signal storage elements within a single storage bank is preferred in order to create a single composite image having extended information content (paragraph 0004). And by replacing each storage bank of Berger with the storage bank of Fossum, each of the storage banks would have enough individual storage elements to store the signals from at least one row of light receiving elements. Therefore, it would have been obvious to one of ordinary skill in the art to modify Berger such that each of the at least two storage banks has enough individual storage elements to store the signals from at least one row of light receiving elements in the array, and that multiple samples of each signal from at least one row of light receiving elements are concurrently stored in different individual signal storage elements, in order to create a single composite image having extended information content, as suggested by Fossum.

19. In regard to **claim 12**, note Berger discloses that a plurality of color filters mated with the plurality of light receiving elements, and the select mechanism is used to send signals from the light receiving elements mated to a single color filter type to a desired signal storage bank such that, for any given row, a single signal storage bank contains signals from a single color type (column 7, lines 5-18; all of the green pixels are transferred to output 27, and all of the red and blue pixels are transferred to output 29).

20. In regard to **claim 13**, note Berger discloses that the color filter is a Bayer pattern in which signals from a single color type are sent to only one of the two signal storage

banks (column 7, lines 5-18 and figure 4a; all of the green pixels are transferred to output 27, and all of the red and blue pixels are transferred to output 29).

21. In regard to **claim 14**, note Berger discloses that the single color type sent to only one of the storage regions is green (column 7, lines 5-18; all of the green pixels are transferred to output 27).

22. In regard to **claim 15**, note Berger discloses that the individual signal storage elements in the signal storage banks are larger than light measuring element pitch (figure 4a; the storage elements 29 are wider than the pixel pitch).

23. In regard to **claim 16**, note Berger discloses that the at least two select mechanisms direct signals from the each of the plurality of light receiving elements to both signal storage banks (column 7, lines 5-18 and figure 4a: 41-44, 47 and 49).

24. In regard to **claim 17**, note Berger discloses that a plurality of signal storage banks and the at least two select mechanisms direct signals to multiple signal storage banks (column 7, lines 5-18 and figure 4a: 27,29,37,39,41-44, 47 and 49).

25. In regard to **claim 18**, note Fossum discloses that a single pixel can be directed to multiple single storage elements within a signal storage bank (paragraphs 0019-0023), and Berger discloses that the pixel signal can be directed to any signal storage bank (column 7, lines 5-18 and figure 4a: 27,29,37,39,41-44, 47 and 49). Therefore, a single pixel can be directed to multiple single storage elements within any signal storage bank.

26. In regard to **claim 19**, note Fossum discloses that adjacent signals from the light receiving elements in the adjacent signal storage elements are averaged to produce a single value (paragraphs 0004, 0017, and 0019-0023).

27. In regard to **claim 20**, note Fossum discloses that a single pixel can be directed to adjacent individual signal storage elements within a signal storage bank (paragraphs 0019-0023; each pixel is sent to a corresponding storage element in each of the registers 120 and 122), and Berger discloses that the pixel signal can be directed to any signal storage bank (column 7, lines 5-18 and figure 4a: 27,29,37,39,41-44, 47 and 49). Therefore, a single pixel can be directed to adjacent individual signal storage elements within any signal storage bank.

28. In regard to **claim 21**, note Fossum discloses that adjacent signals from the light receiving elements in the adjacent signal storage elements are averaged to produce a single value (paragraphs 0004, 0017, and 0019-0023).

29. In regard to **claim 26**, note Berger discloses a camera comprising an x-y addressable image sensor comprising a plurality of light receiving elements arranged in an array of rows and columns that convert the light to a signal (column 6, lines 50-67 and figure 4a), at least two signal storage banks comprised of individual signal storage elements (column 7, lines 5-18 and figure 4a: 27,29,37, and 39), the at least two storage banks having enough individual storage elements to store the signals from at least one row of light receiving elements in the array (column 7, lines 5-18 and figure 4a: 27,29,37, and 39), and at least two select mechanisms which can direct signals from the plurality of light measuring elements to any single or combination of the signal

storage banks (column 7, lines 5-18 and figure 4a: 41-44, 47 and 49). Therefore, it can be seen that Berger fails to disclose that each of the at least two storage banks has enough individual storage elements to store the signals from at least one row of light receiving elements in the array, and that multiple samples of each signal from at least one row of light receiving elements are concurrently stored in different individual signal storage elements.

In analogous art, Fossum discloses the use of a storage bank that concurrently stores multiple samples of each signal from at least one row of light receiving elements in different individual signal storage elements within a single storage bank (paragraphs 0019-0023, and figure 1a: 102 and 122; the combination of register 120 and 120 is considered to be a single storage bank used to store multiple samples of each pixel). Fossum teaches that concurrently storing multiple samples of each signal from at least one row of light receiving elements in different individual signal storage elements within a single storage bank is preferred in order to create a single composite image having extended information content (paragraph 0004). And by replacing each storage bank of Berger with the storage bank of Fossum, each of the storage banks would have enough individual storage elements to store the signals from at least one row of light receiving elements. Therefore, it would have been obvious to one of ordinary skill in the art to modify Berger such that each of the at least two storage banks has enough individual storage elements to store the signals from at least one row of light receiving elements in the array, and that multiple samples of each signal from at least one row of light receiving elements are concurrently stored in different individual signal storage

elements, in order to create a single composite image having extended information content, as suggested by Fossum.

30. In regard to **claim 27**, note Berger discloses a plurality of color filters mated with the plurality of light receiving elements, and the select mechanism is used to send signals from the light receiving elements mated to a single color filter type to a desired signal storage bank such that, for any given row, a single signal storage bank contains signals from a single color type (column 7, lines 5-18; all of the green pixels are transferred to output 27, and all of the red and blue pixels are transferred to output 29).

31. In regard to **claim 28**, note Berger discloses that the color filter is a Bayer pattern in which a color of a single type is sent to only one of the two signal storage banks (column 7, lines 5-18 and figure 4a; all of the green pixels are transferred to output 27, and all of the red and blue pixels are transferred to output 29).

32. In regard to **claim 29**, note Berger discloses that the single color type sent to only one of the storage regions is green (column 7, lines 5-18; all of the green pixels are transferred to output 27).

33. In regard to **claim 30**, note Berger discloses that the individual signal storage elements in the signal storage banks are larger than light measuring element pitch (figure 4a; the storage elements 29 are wider than the pixel pitch).

34. In regard to **claim 31**, note Berger discloses that the at least two select mechanisms direct signals from the each of the plurality of light receiving elements to both signal storage banks (column 7, lines 5-18 and figure 4a: 41-44, 47 and 49).

35. In regard to **claim 32**, note Berger discloses a plurality of signal storage banks and the at least two select mechanisms direct signals to multiple signal storage banks (column 7, lines 5-18 and figure 4a: 27,29,37,39,41-44, 47 and 49).

36. In regard to **claim 33**, note Fossum discloses that a single pixel can be directed to multiple single storage elements within a signal storage bank (paragraphs 0019-0023), and Berger discloses that the pixel signal can be directed to any signal storage bank (column 7, lines 5-18 and figure 4a: 27,29,37,39,41-44, 47 and 49). Therefore, a single pixel can be directed to multiple single storage elements within any signal storage bank.

37. In regard to **claim 34**, note Fossum discloses that adjacent signals from the light receiving elements in the adjacent signal storage elements are averaged to produce a single value (paragraphs 0004, 0017, and 0019-0023).

38. In regard to **claim 35**, note Fossum discloses that a single pixel can be directed to adjacent individual signal storage elements within a signal storage bank (paragraphs 0019-0023; each pixel is sent to a corresponding storage element in each of the registers 120 and 122), and Berger discloses that the pixel signal can be directed to any signal storage bank (column 7, lines 5-18 and figure 4a: 27,29,37,39,41-44, 47 and 49). Therefore, a single pixel can be directed to adjacent individual signal storage elements within any signal storage bank.

39. In regard to **claim 36**, note Fossum discloses that adjacent signals from the light receiving elements in the adjacent signal storage elements are averaged to produce a single value (paragraphs 0004, 0017, and 0019-0023).

40. **Claims 23 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kochi (US Pub. 2002/0018131) in view of Bayer (US Patent 3,971,065).**

41. In regard to **claim 23**, note Kochi discloses that a decoder is used to change the timing of pixel selection so that various read-out orders can be set (paragraph 0047; the read-out order is considered to select which pixels are to be combined). In analogous art, Bayer discloses the use of an imaging array having color filter array (column 6, lines 7-20, and figure 6). Bayer teaches that the use of an imaging array having a color filter array is preferred in order to allow a single sensor to capture image data that is uniform for all three color vectors (column 2, lines 18-62). Therefore, it would have been obvious to one of ordinary skill in the art to modify Kochi to include the use of a color filter in order to provide image data that is uniform for all three color vectors, as suggested by Bayer. And through the combination of Kochi with Bayer, depending on the selected timing of the decoder for pixel read-out, if the timing is set such that pixels having similar color are both selected while in the pixel addition mode, they are combined.

42. In regard to **claim 38**, note Kochi discloses that a decoder is used to change the timing of pixel selection so that various read-out orders can be set (paragraph 0047; the read-out order is considered to select which pixels are to be combined). In analogous art, Bayer discloses the use of an imaging array having color filter array (column 6, lines 7-20, and figure 6). Bayer teaches that the use of an imaging array having a color filter array is preferred in order to allow a single sensor to capture image data that is uniform

for all three color vectors (column 2, lines 18-62). Therefore, it would have been obvious to one of ordinary skill in the art to modify Kochi to include the use of a color filter in order to provide image data that is uniform for all three color vectors, as suggested by Bayer. And through the combination of Kochi with Bayer, depending on the selected timing of the decoder for pixel read-out, if the timing is set such that pixels having similar color are both selected while in the pixel addition mode, they are combined.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US005786588: note the use of multiple column output circuits.

US006867806: note the use of shared floating diffusion nodes to combine pixels.

US006486504B1: note the use of combining multiple samples of the same pixel.

US006008486A: note the use of combining multiple samples of the same pixel.

US 20040041927A1: note the use of averaging multiple samples of pixel data.

US006750912B1: note the use of shared floating diffusion nodes.

US006791612B1: note the use of shared floating diffusion nodes.

US007443437B2: note the use of shared floating diffusion nodes.

US005543838A: note the use of shared floating diffusion nodes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISS S. YODER III whose telephone number is (571)272-7323. The examiner can normally be reached on M-F: 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. S. Y./
Examiner, Art Unit 2622

/NHAN T TRAN/
Primary Examiner, Art Unit 2622